UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,995	08/31/2001	Kazuyoshi Tokunaga	H07-137077M/STS	9298

21254 7590 05/16/2006

MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

EXAMINER	
MURPHY, DILLON J	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/942,995	TOKUNAGA ET AL.	
	Examiner	Art Unit	
	Dillon J. Murphy	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

- This action is responsive to the supplemental amendment filed on April 19, 2006.
- Claims 1-23 are pending. Claim 23 is new.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 19, 2006 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 3, 13, 14, and 18-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (US 6354630), hereafter Zhang.

Regarding claim 1, Zhang teaches an invisible information recording method comprising:

Extracting a location of at least one blank area of a page image of a sheet of paper, wherein said location of said at least one blank area is different from a location of an image, which is visible to the naked eye (Zhang, fig 1, print control symbol #214 separate from informational content #210. Informational content is visible to the naked eye), of said page image of said sheet of paper (Zhang, col 4, ln 53-60, wherein blank portions of document are extracted from page, i.e. multiple positions are extracted and a plurality of codes are printed, with location separated from the informational content of the printed matter, col 3, ln 53-60); and

Recording a digital image on said location of said at least one blank area on said sheet of paper (Zhang, fig 1, print control symbol #214, i.e. digital image, is recorded in said location on the page);

Wherein said digital image comprises information in the form of pixels so sized as to be invisible to a naked eye and at a print density invisible to the naked eye (Zhang, col 3, ln 25-32, wherein information is sized such that it is not apparent to a viewer, and col 4, ln 54-60, wherein information is preferably invisible to the naked eye).

Regarding claim 2, which depends from claim 2, Zhang teaches a method wherein each of the pixels so sized as to be invisible to the naked eye is 75 micrometers or less in diameter (Zhang, col 4, ln 1-21, pixels may be sized as small as 0.025 mm, i.e. 25 micrometers).

With regard to claim 3, which depends from claim 2, Zhang teaches further that each of the pixels so sized as to be invisible to the naked eye corresponds to one or a plurality of image forming elements used for a device for forming a digital image (Zhang, col 4, ln 1-21, wherein bit characters, sized to be invisible, correspond to the digital image. Also see fig 1, bit characters #216 are used for a device for forming a digital image).

With regard to claim 13, which depends from claim 1, Zhang teaches a method wherein such information formed by coarsely distributing the pixels each so sized as to be invisible to the naked eye so as to have a print density invisible to the naked eye is recorded into a plurality of locations on one page of a digital image (Zhang, col 2, ln 34-44, wherein the identification pattern includes a plurality of locations that are selected to identify the medium. Also see col 4, ln 53-60, wherein the invisible information is recorded at predetermined positions, i.e. a plurality of positions, on the printed matter).

With regard to claim 14, Zhang teaches a recording apparatus for recording invisible information on a sheet of paper according to any one of claims 1 to 11 (Zhang, col 15, ln 40-48, and fig 6, printers #348, wherein printers are described and shown for imprinting invisible information on printed matter).

Regarding claim 18, which depends from claim 1, Zhang teaches an invisible information recording method wherein said recording the digital image comprises recording the digital image only in said at least one blank area of said page image of said sheet of paper (Zhang, col 4, ln 53-60, wherein area allocated for printing invisible

information is spatially separated from the informational content of the printed matter, i.e. the invisible information is printed only in a blank area of the page).

Regarding claim 19, which depends from claim 1, Zhang teaches an invisible information recording method wherein said information comprises at least one of a horizontal arrangement and a vertical arrangement in said at least one blank area of said page image of said sheet of paper (Zhang, col 10, ln 61-64, wherein the invisible information may be encoded in a rectangular M x N fashion, allowing for both horizontal or vertical arrangement. See also Table III of Zhang, col 11, wherein various horizontal and vertical arrangements are shown).

Regarding claims 20 and 21, which depend from claim 1, respectively, Zhang teaches an invisible information recording method wherein said extracting comprises extracting a plurality of substantially rectangular blank areas from said page image of said sheet of paper (Zhang, col 4, ln 53-60, wherein a plurality of locations are extracted from document to be printed on. Also see col 10, ln 61-64, wherein the invisible information may be encoded in a rectangular M x N fashion, allowing for both horizontal or vertical arrangement. See also Table III of Zhang, col 11, wherein various horizontal and vertical arrangements are shown. Extracting a location is inherent to the recording method as taught by Zhang. See also col 14, ln 37-40, wherein rectangular areas are extracted and printed on).

Regarding claim 22, which depends from claim 21, Zhang teaches an invisible information recording method wherein said recording the digital signal comprises recording a copy of at least a portion of said information into the at least one other

location of said plurality of locations of said blank areas (Zhang, col 4, ln 53-60, wherein the printer prints the print control symbol at predetermined positions. The use of the word "the" in "the print control symbol" teaches one block of information, and "at predetermined positions" teaches at a plurality of locations. It has been shown in col 3, ln 53-60, that the print control symbol is printed at a position separated from the printed informational content on the medium).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Gasper et al. (U.S. 5,919,730), hereafter Zhang and Gasper.

Regarding claim 4, which depends from claim 1, Zhang teaches an invisible information recording method comprising extracting a location of a page and recording a digital image wherein said digital image is invisible to the naked eye. Zhang does not disclose expressly wherein each of the pixels so sized as to be invisible to the naked eye is printed using a yellow color developer. Gasper, however, teaches a method wherein each of the pixels so sized as to be invisible to the naked eye is printed using a

yellow color developer (Gasper, col 7, ln 61-66, preferred color of pixels to be yellow in color).

Zhang and Gasper are combinable because they are from a similar field of endeavor of recording information on a page such that it is impossible for a casual observer to detect the information. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine method of Gasper comprising recording invisible information with yellow color developer with the with the invisible information recording method Zhang comprising extracting a blank area from a document separate from a visible image and recording an invisible digital image in said location. The motivation for doing so would have been to maintain the high quality and utility of the document (Gasper, column 3, lines 59-62), as well as to encode information concerning the printed matter, such as sequencing information (Zhang, col 3, ln 59-62). Therefore, it would have been obvious to combine Gasper with Zhang to obtain the invention as specified in claim 4.

With regard to claim 5, the combination of Zhang and Gasper teaches the yellow color developer is formed of ink or toner (Gasper, col 9, ln 19-21).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Bouldin et al. (US 4837134) and further in view of Dickerson et al. (US 5633126), hereafter referred to as Zhang, Bouldin, and Dickerson.

Regarding claim 8, which depends from claim 2, Zhang teaches an invisible information recording method comprising extracting a location of a blank area of a page

separate from a visible image, recording a digital image on said location, wherein said digital image comprises information in the form of pixels so sized as to be 75 micrometers or less and at a print density invisible to the naked eye, as explained above in the rejection of claim 2. Zhang does not teach an invisible information recording method wherein a print density invisible to the naked eye is such that the pixels each so sized as to be invisible to the naked eye are coarsely distributed and an image density is 0.1 or less. Bouldin, however, teaches an invisible information recording method wherein a print density invisible to the naked eye is such that the pixels each so sized as to be invisible to the naked eye are coarsely distributed and an image density is 0.1 or less (Bouldin, col 5, ln 39-43, and fig 2, pixel elements #18 and #19, wherein the pixel density of the encoded information is less than 0.1).

Zhang and Bouldin are combinable because they are from a similar field of endeavor of encoding information invisible to the naked eye. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the method of Bouldin comprising encoding information with an image density less than 0.1 with the method of invisible information recording of Zhang comprising extracting a location of a blank area of a page separate from a visible image, recording a digital image on said location, wherein said digital image comprises information in the form of pixels so sized as to be 75 micrometers or less and at a print density invisible to the naked eye. The motivation for doing so was suggested by Dickerson, who also encodes information at an image density less than 0.1. By encoding information at such an image density, it is possible to provide a digital image such that the image is

substantially colorless to the eye (Dickerson, col 16, ln 10-11). Therefore it would have been obvious to combine Bouldin as per the teaching of Dickerson with Zhang to obtain the invention as specified in claim 8.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Yano et al. (U.S. 6,035,308), hereafter Zhang and Yano.

Regarding claim 6, which depends from claim 1, and claim 7, which depends from claim 6, Zhang teaches an invisible information recording method comprising extracting a location of a blank area of a page separate from a visible image, recording a digital image on said location, wherein said digital image comprises information in the form of pixels so sized as to be invisible to a naked eye and at a print density invisible to a naked eye, as explained above in the rejection of claim 1. Zhang does not disclose expressly an invisible information recording method wherein the invisible information is printed using an ultraviolet rays color developer, ink or toner. Regarding claim 6, Yano teaches the embedding of information in a document using an ultraviolet color rays developer, and regarding claim 7, Yano teaches the specific use of ink or toner (Yano, col 33, ln 53-63).

Zhang and Yano are combinable because they are from the same field of endeavor of printing and embedding information on a page and linking the embedded information. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Zhang to include the use of an ultraviolet color rays developer, ink or toner as suggested by Yano in order to increase the quantity of information stored within a document without restriction due to character size, or without displeasing the

reader (Yano, col 3, ln 39-44). Therefore, it would have been obvious to combine Yano with Zhang to obtain the invention as specified in claims 6 and 7.

Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Cass et al. (U.S. 5,946,414), hereafter Zhang and Cass. As previously mentioned, Zhang teaches an invisible information recording method comprising extracting a location of a blank area of a page separate from a visible image, recording a digital image on said location, wherein said digital image comprises information in the form of pixels so sized as to be invisible to a naked eye and at a print density invisible to a naked eye. Also, Zhang teaches the structuring of the grouping (Zhang, fig 1), but does not disclose the specific details of the grouping.

With regard to claim 9, which depends from claim 1, Zhang fails to disclose expressly an invisible information recording method where 16 image-forming elements is a recording unit. In the information recording method taught by Cass, "signal blocks," i.e. "recording units," are used as the base of encoding information. The "signal blocks" of Cass consist of a varying number of "color cells," consisting of "printer cells," i.e. pixels, which are the smallest unit of the absence or presence of a mark on a printed medium (Cass, col 14, ln 59-63). Choosing K, the number of "color cells" in a "signal block", equal to 1, defines a "signal block" consisting of 16 "printer cells." Thus the "signal block" with one "color cell" (Cass, Figure 48, #344) is formed with 16 "printer cells" (Cass, Figure 48, #342). In this manner the method of forming "signal blocks" is identical to forming "recording units."

With regard to claim 10, which depends from claim 9, Cass teaches a method of pattern-based encoding, where "signal blocks," i.e. recording units, can stand alone or they can be further grouped together to express a message in a "message image" (Cass, Figure 14, #675). In one embodiment, Cass uses a 1-Dimensional array to encode a message (Cass, col 18, ln 62-64). The message of Cass is not limited in length, and may have a length of six units (Cass, col 15, ln 40-49). Thus, a "message image," i.e. a "significant block," consists of six "signal blocks," i.e. "recording units." In this manner the method of forming a "message image" is identical to forming a "significant block."

With regard to claim 11, which depends from claim 10, Cass teaches the encoding of "signal blocks," i.e. "recording unit," to represent "1" in a "message image," i.e. a "significant block" (Cass, column 18, lines 60-62. It is well known in the art that a complete signal always comprises a "1." Additionally, see Zhang, col 6, ln 65-67, wherein a "framing bit" is always a "1." Also see Zhang, col 7, ln 3-7, wherein an odd parity check is used for error detection, requiring at least one element to be a "1.")

Zhang and Cass are combinable because they are from a similar problem solving area of encoding information on a media in a manner that is invisible to the naked eye. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the patterned and rectangular arrangement of microdots in Zhang to include the specific use of the "recording unit" and "significant block," and to use "recording units" to represent a "1" in a "significant block" to reliably encode information at a high density rate in an image (Cass, column 6, lines 42-44). As per the teaching of Zhang

recording invisible information on a blank area on a medium, it would have been obvious at the time of the invention to apply the encoding techniques of Cass to a digital image separate from the visible image on the medium. The motivation for doing so would have been to define a print-control region, i.e. to define invisible information on a page, to aide in the detection of the information by providing a framing bit at the first corner of the region (Zhang, col 2, ln 53-58). Therefore, it would have been obvious to combine Cass with Zhang to obtain the invention as specified in claims 9, 10, and 11.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Cass and further in view of Hayashi et al. (US 2003/0161496 A1), hereafter referred to as Zhang, Cass, and Hayashi.

Regarding claim 12, which depends from claim 10, the combination of Zhang, and Cass teaches an invisible information recording method comprising extracting a location of a blank area of a page separate from a visible image, recording a digital image on said location, wherein said digital image comprises information in the form of pixels so sized as to be invisible to a naked eye and at a print density invisible to a naked eye, wherein each print density invisible to a naked eye is such that 16 pixels grouped together is a recording unit, and wherein 6 adjacent recording blocks form one significant block, and wherein at least one of the significant blocks comprises a recording unit which always represents a "1," as explained above in the rejection of claim 10. The combination of Zhang and Cass does not disclose expressly an invisible information recording method wherein at least one of the significant blocks comprises a

recording unit representative of a parity check. Hayashi, however, teaches a method of invisible information recording using parity bits in an embedded digital watermark (page 9, paragraph #219).

Hayashi teaches an arrangement of the grid based encoded information with parity check (Hayashi, fig 21B). Hayashi also teaches parity bits, P1-P16, embedded in the digital watermark for error correction (Hayashi, fig 21B, see also paragraph #219).

Zhang, Cass, and Hayashi are combinable because they are from a similar problem solving area of printing and encoding information reliably as watermarks or pixels on a paper. At the time of invention, it would have been obvious to one of ordinary skill in the art to modify the combination of Zhang Cass teaching an invisible information recording method comprising extracting a location of a blank area of a page separate from a visible image, recording a digital image on said location, wherein said digital image comprises information in the form of pixels so sized as to be invisible to a naked eye and at a print density invisible to a naked eye, wherein each print density invisible to a naked eye is such that 16 pixels grouped together is a recording unit, and wherein 6 adjacent recording blocks form one significant block, and wherein at least one of the significant blocks comprises a recording unit which always represents a "1", with the method of Hayashi comprising a parity check. The motivation for doing so would have been to provide a method of encoding that is superiorly robust against attacks, and can embed a large amount of information (Hayashi, page 1, paragraphs 12-13). The suggestion for doing so was given by Cass, in col 15, ln 44-46, which teaches that message data may include error correction codes and any other such data as might be

needed to facilitate decoding, such as a parity bit, and additionally in col 3, ln 19-25. Therefore, it would have been obvious to combine Hayashi with the aforementioned combination of Zhang and Cass to obtain the invention as specified in claim 12.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boswell (U.S. 5,559,933) in view of Zhang, hereafter Boswell and Zhang.

Regarding claim 15, Boswell teaches an archiving printer capable of printing a document and storing and reprinting the document as document data in an archive (Boswell, column 5, lines 1-4). The printing system taught by Boswell further teaches a recording section for recording archive management information on a document (Boswell, column 5, lines 13-22). Boswell also teaches a knowing section for knowing the archive management information on the printed document (Boswell, column 25, lines 34-42). Boswell does not disclose expressly a printing system for printing information in a state that is invisible to the human eye, Boswell does not teach a blank area extracting section that extracts a location of at least one blank area in a page image of a document, wherein said location of said blank areas are different from location of a visible image, nor does Boswell does not teach a reading section for reading out the information being recorded in an invisible manner. Zhang teaches a printing system comprising a blank area extraction section that extracts a location of at least one blank area in a page image of a document (Zhang, fig 1, print control symbol #214 separate from informational content #210. Informational content is visible to the naked eye. Print control symbol is invisible to naked eye, col 4, ln 58-60), wherein said

location of said blank areas are different from location of a visible image (Zhang, col 4, ln 53-60, wherein blank portions of document are extracted from page, with location separated from the informational content of the printed matter). Zhang also teaches a reading section capable of reading the invisible information being recorded (Zhang, col 16, ln 19-33, reading invisible information being recorded).

Boswell and Zhang are combinable because they are from the same field of endeavor, namely printing systems and archiving information for reprinting. At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the blank area extraction section to record invisible information as well as the reading section from Zhang to read the information recorded in the invisible manner with the printing system recording the archive management information taught by Boswell. The motivation for doing so would have been to control when, where, and how print files are to be printed (Boswell, column 4, lines 26-28), to encode information concerning the printed matter, such as sequencing information (Zhang, col 3, ln 59-62). Therefore, it would have been obvious to combine Zhang with Boswell to obtain the invention as specified in claim 15.

Regarding claims 16 and 17, which depend from claim 15, respectively, the combination of Boswell and Zhang teaches a printing system wherein the recording section records and embeds the archive management information of the document at the time of printing the document (Zhang, col 4, ln 39-43, wherein invisible archive management is embedded at time of printing the document) in a state that the

information is invisible to the human eye or needs a careful watching to see the information (Zhang, col 4, ln 58-60, invisible information);

The recording section records one and the same information into a plurality of locations of blank areas (Zhang, col 4, ln 53-60, wherein the printer prints the print control symbol at predetermined positions. The use of the word "the" in "the print control symbol" teaches one block of information, and "at predetermined positions" teaches at a plurality of locations. It has been shown in col 3, ln 53-60, that the print control symbol is printed at a position separated from the printed informational content on the medium); and

The reading section includes an optical scanning section for scanning at least a part of the document (Zhang, col 16, ln 12-33, reading section scans document for print control symbols. See fig 7 for scanners #120, #122, #124, and #126).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Bouldin further in view of Dickerson.

Regarding claim 23, Zhang teaches an invisible information recording method comprising:

Extracting locations of a plurality of blank areas of a page image of a sheet of paper (Zhang, col 2, ln 34-44, wherein the identification pattern includes a plurality of locations that are selected to identify the medium. Also see col 4, ln 53-60, wherein the invisible information is recorded a predetermined positions, i.e. a plurality of positions, on the printed matter), wherein each of said locations of said blank areas are different

from locations of images (Zhang, col 3, ln 53-60, wherein print control symbol, i.e. invisible information, is printed at a predetermined location on the printed matter separate from the printed informational content, i.e. visible information), which are visible to the naked eye, of said page image of said sheet of paper; and

Recording a plurality of image forming elements used for a device for forming a digital image in said locations of said blank areas on said sheet of paper (Zhang, col 4, ln 53-60, wherein the invisible information is recorded a predetermined positions, i.e. a plurality of positions, on the printed matter. Also see fig 1, wherein print control symbol #214 is made up of a plurality of bit characters #216, col 5, ln 52-60);

Wherein said digital image comprises information in the form of pixels so sized as to be invisible to a naked eye and at a print density invisible to the naked eye (Zhang, col 4, ln 58-60, wherein print control symbol, i.e. digital image, is sized to be invisible to the naked eye),

Wherein said recorded information comprises at least one of a horizontal arrangement and a vertical arrangement in said blank areas of said page image of said sheet of paper (Zhang, col 10, ln 61-64, wherein the invisible information may be encoded in a rectangular M x N fashion, allowing for both horizontal or vertical arrangement. See also Table III of Zhang, col 11, wherein various horizontal and vertical arrangements are shown), and

Wherein said recording the digital image comprises recording a copy of at least a portion of said information into at least one other location of said plurality of locations of said blank areas (Zhang, col 4, ln 53-60, wherein the printer

prints the print control symbol at predetermined positions. The use of the word "the" in "the print control symbol" teaches one block of information, and "at predetermined positions" teaches at a plurality of locations. It has been shown in col 3, ln 53-60, that the print control symbol is printed at a position separated from the printed informational content on the medium).

Zhang does not disclose expressly an invisible information recording method wherein a print density invisible to the naked eye is such that the pixels each so sized as to be invisible to a naked eye are coarsely distributed and an image density 0.1 or less. Bouldin, however, teaches an invisible information recording method wherein a print density invisible to the naked eye is such that the pixels each so sized as to be invisible to the naked eye are coarsely distributed and an image density is 0.1 or less (Bouldin, col 5, ln 39-43, and fig 2, pixel elements #18 and #19, wherein the pixel density of the encoded information is less than 0.1).

Zhang and Bouldin are combinable because they are from a similar field of endeavor of encoding information invisible to the naked eye. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the method of Bouldin comprising encoding information with an image density less than 0.1 with the method of invisible information recording as taught by Zhang comprising extracting a locations of a blank area of a page separate from a visible image, recording a plurality of digital images on said locations, wherein said digital image comprises pixels sized and spaced as to be invisible to the naked eye, wherein the recorded information comprises a vertical or horizontal arrangement, and wherein the recording

comprises recording a copy of a portion of the information into a plurality of locations. The motivation for doing so was suggested by Dickerson, who also encodes information at an image density less than 0.1. By encoding information at such an image density, it is possible to provide a digital image such that the image is substantially colorless to the eye (Dickerson, col 16, ln 10-11). Therefore it would have been obvious to combine Bouldin as per the teaching of Dickerson with Zhang to obtain the invention as specified in claim 23.

Response to Arguments

Applicant has incorporated the alleged traversal arguments set forth in the amendment filed February 23, 2006 into the supplemental amendment filed April 19, 2006.

Applicant's arguments filed February 23, 2006 have been fully considered but they are not persuasive.

Regarding claim 1, applicant argues that Gasper and Zhang are not combinable, with Gasper teaching away from Zhang (Remarks, page 17, ln 1-9). In light of new grounds of rejection for claim 1, this argument is moot, however the examiner is still relying on the combination of Zhang in view of Gasper for the rejections of claims 4 and 5. The examiner respectfully disagrees regarding the combining of Zhang and Gasper, citing Gasper in col 3, ln 51-62, wherein the advantages and objective of the invention of Gasper is to provide an image that encodes information in a document that is invisible to a human but detectable by a machine, without degrading the quality of the

document. The examiner also cites Zhang, in col 3, ln 25-32, wherein Zhang provides a system and method for encoding information in a non-intrusive manner, i.e. not detectable by an observer, within a document. Both inventions are related to invisible information recording, and both Zhang and Gaper are motivated to encode information readable by only a machine without degrading the quality of the printed matter on the document.

Regarding claim 13, applicant argues on page 8, lines 1-10, that Zhang teaches encoding a print control symbol at only one predetermined location. The examiner respectfully directs the applicant to col 4, lines 53-60 of Zhang wherein print control symbols are printed at predetermined positions (i.e. a plurality of positions) separate from the informational content of the printed matter. Also see col 3, lines 50-63, wherein Zhang explicitly states that the invisible image is printed separate from any informational content on the document, i.e. the invisible image is recorded on blank locations in the document.

Regarding claims 16 and 17, rejected under 35 U.S.C. 103a over Boswell, Zhang, Gasper, and Ur, applicant argues, on pages 22-24, that Ur does not teach extracting a plurality of blank areas. This argument is moot in view of the new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon J. Murphy whose telephone number is (571) 272-5945. The examiner can normally be reached on M-F, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on (571) 272-7471. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJM

KIMBERLY WILLIAMS
SUPERVISORY PATENT EXAMINER